Indigenous hunting in the Russian Arctic: toward sustainable wildlife resource management

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Abstract. Arctic wildlife resource management must secure biodiversity without infringing on indigenous hunting rights. The article focuses on the bottlenecks in resource management of game species hunted by Arctic indigenous population. It is based on data collected by the author on subsistence and commercial hunting by indigenous peoples in several Russian Arctic regions and on the results of CAFF Arctic Migratory Birds Initiative (AMBI) projects on the assessment of hunting impact on Arctic migratory birds. Three main problems of Arctic game resource management are discussed: gapes in legislation related to the contradiction between the right of Arctic indigenous peoples to hunt without permission and the need to restrict hunting in order to maintain the balance of ecosystems; lack of reliable information on hunting resources, including both population numbers and harvest size; the practically total removal of hunters from the management of hunting resources. The Russian game resource management system in its current state does not meet the Arctic conditions. It needs to be revised towards official liberalization of indigenous hunting and more flexible game resource regulation considering interests of different groups of hunters.

1 Introduction

The sustainable management of wildlife resources in the Arctic aims, on the one hand, to minimize risks to biodiversity and, on the other hand, to ensure indigenous peoples' harvesting rights. However, while fully recognizing the importance of traditional hunting practices and the political dimension of indigenous rights, it should be noted that traditional harvesting is not necessarily synonymous with its sustainability [1]. The indigenous hunters' interests do not always coincide with the conservation goals, and competition for resources may arise between indigenous and non-indigenous hunters. This result is a rather complex set of Arctic wildlife resource management problems that require an interdisciplinary approach to analyze and address.

In Alaska and Canada, these issues have been actively developed for more than half a century. classic works are H. Huntington's monograph [2], in which he describes and evaluates various federal, state, local, and cooperative wildlife management regimes and discusses international treaties governing the migration of waterfowl, whales, polar bears, and caribou, and publications by F. Berkes [3], who outlines the role of traditional knowledge in wildlife resource management. In Canada and Alaska there are a large number of publications with statistical data on indigenous subsistence hunting (e.g. [4]), as well as on the management of the most important game populations for indigenous peoples (primarily, caribou populations).

In Russia, there are no scientific publications specifically devoted to Arctic aboriginal hunting in general, but there are many works on the management of specific populations: wild reindeer, sable and others. Below we will focus on some of them.

This article discusses the resource management bottlenecks of the most important large and small game species hunted by the indigenous peoples of the Russian Arctic. It is based on data collected by the author in the course of many years of research on indigenous hunting, both subsistence and commercial, in various regions of the Russian Arctic from the Kola Peninsula to Chukotka. These studies used methods of informal and formal interviews, anonymous questionnaires, participatory mapping, content analysis of documents, and examination of statistical data. Of particular importance among them were the international project "Tundra. Drivers of Change in Tundra Ecosystems" (Norwegian Research Council Project, 2010-2014), which included three case studies in Kola Peninsula, Yamal and Taimyr, and a series of projects aimed at assessing the impact of hunting on populations of migratory Arctic birds (including geese, ducks, waders, seabirds, etc.) based on an anonymous survey of hunters. These studies were conducted jointly with Dr. Evgeny E. Syroechkovskiy in Chukotka, northern Yakutia, and the Nenets Autonomous District [5].

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These projects were followed by a study of hunting pressure on Arctic-nesting bird populations on their migration routes, which was launched in the Northeast Russia in 2019 as part of the Arctic Migratory Birds Initiative (AMBI) of the Arctic Council Working Group on the Conservation of Arctic Flora and Fauna (CAFF) [6]. All these materials, as well as data from the official website of the Federal Center for the Development of Hunting Economy [7] and a number of scientific publications have been analyzed and summarized as part of the project of the Russian Science Foundation (No. 18-18-00309) and discussed in this paper.

2 Game resources of the Russian Arctic

The traditional use of wildlife resources is the basis of the distinctive cultural values of the indigenous peoples of the Russian Arctic. Game is an important resource for them. The list of the main game species hunted by the Arctic indigenous population includes two groups of birds: migratory waterfowl (geese and ducks) and sedentary grouse (ptarmigan, grouse, capercaillie, black grouse); fur-bearing animals (arctic fox in the tundra, sable and squirrel in the taiga, as well as several widespread species – fox, wolverine, ermine, muskrat, etc.); ungulates (wild reindeer, elk, snow sheep, musk ox), large predators (brown and polar bears and wolf), and the Arctic hare.

Over the past decades, a decline in the purchase price of fur-bearing animal skins, combined with an increase in the price for cartridges, hunting weapon and equipment, has made commercial hunting of most of these species unprofitable. Now, only wild reindeer and sable are essential for commercial hunting. For subsistence hunting, primarily feathered game (ducks, geese, ptarmigan) and ungulates (wild reindeer and elk) are important. Indigenous peoples hunt bears and wolves mainly for their own safety and to protect herds of domestic reindeer. Bears and ungulates are important for trophy hunting, however, indigenous people do not participate in it.

The game resource state in the Russian Arctic is generally satisfactory, but not for all species. Over the past two decades, there has been a sharp decline in the tundra populations of wild reindeer, especially in northern Yakutia, and in the Taimyr population of reindeer, the largest in Eurasia. The state of migratory birds resources (ducks and geese) varies in different sectors of the Russian Arctic. In the western sector, populations of Arctic-nesting birds migrating along the East Atlantic Flyway are mostly stable. On the contrary, in the eastern Arctic, many populations of waterfowl and waders following the East Asian-Australasian Flyway are depressed and continue to decline in numbers [8]. This is due to anthropogenic reduction of wetlands and strong hunting pressure at wintering areas and migration stopovers in the countries of East Asia. Hunting at migration stopovers in Kamchatka and Sakhalin can also affect the stability of some Arctic-nesting waterfowl and wader populations.

Some Arctic animals species, on the contrary, are increasing in their numbers [7]. This is, for example, the brown bear and, in some regions, the wolf. The increase in the number of predators significantly complicates the traditional reindeer husbandry of indigenous peoples. In addition, every year there are cases of human deaths from bear aggression.

3 The main features of indigenous hunting in the Russian Arctic

Unlike the central regions of Russia, where hunting is mainly a recreational activity, in the Arctic it is an important part of the subsistence economy. For the indigenous population of the Arctic, hunting is primarily a source of meat to feed the family and maintain ethnic traditions. Among the indigenous people, there are also those who is engaged in professional hunting, receiving their main income from it. These are mainly sable hunters and trappers in the northern taiga of Eastern Siberia, and wild reindeer hunters in Taimyr and Yakutia. In contrast, for most non-indigenous hunters in the Arctic, hunting is most often a hobby, and obtaining food products from hunting is secondary.

The traditional use of natural resources by the indigenous population is considered environmentally balanced. This is noted even in the federal law of the Russian Federation [9]. It is believed that the members of the traditional society when using natural resources follow the imperative: do not take more from nature than it is necessary to satisfy your essential needs. This imperative stems from the desire to minimize labor costs in traditional communities [10]. It took root as a tradition among all northern peoples and has enabled them to survive in the extreme conditions of the Arctic. In should be noted that, following it, humans can upset the environmental balance, if it is necessary to provide themselves with food and other necessary products of hunting. As Igor Krupnik showed [11], this imperative did not exclude local overhunting, sometimes on a large scale. The fact that the indigenous population considers hunting primarily as a source of food was confirmed by the results of anonymous questionnaire survey of indigenous hunters, which we conducted together with Dr. Evgeniy Syroechkovskiy in Chukotka, Yakutia and the Nenets Autonomous District. Answering the question, what the main importance of bird hunting for your family is, most of the indigenous hunters chose the answer "food supply".

Modern (non-traditional) society is widely known to be guided by the rule not to take from the ecosystem more than it can give without compromising resource reproduction. People of modern society are ready to limit their needs in order to preserve the balance of the ecosystem (at least in theory). it is implicitly assumed that such a restriction does not threaten their life and health. However, from the point of view of Arctic indigenous people, the need to limit their hunting needs for reasons of environmental ethics is not always obvious. Although there are no longer people in the Russian Arctic whose survival is completely tied to the

results of hunting, there are indigenous communities where families' budgets depend mainly on the amount of game they caught. Therefore, it is not surprising that in response to the "provocative" question in our anonymous questionnaire, "Do you think it is acceptable to shoot red-listed species if it is necessary family sustenance?" we received up to 15% answers stating that these species can be shot for sustenance.

4 Hunting regulation

The regulation of hunting in the Russian Arctic is based on federal and regional laws and by-laws issued by federal and regional agencies. Federal legal acts apply to the entire territory of Russia and are focused primarily on the population of central regions, where the majority of hunters live. Although hunting legal acts have provisions specifically related to indigenous peoples of the North, in general they do not meet the specific conditions of the Arctic. A number of problematic situations are associated with this.

Firstly, according to the federal law "On Hunting" [12], hunting grounds are divided into two categories: public and assigned. Assigned lands are considered to be those which are leased to an organization or an individual entrepreneur for a certain period of time under a special agreement. Only the person who won first place in the auction can conclude such a contract. The contract obliges the lessee to ensure the rational use and protection of game at its own expense. The assigned hunting grounds may occupy up to 80% of the area of each region, so that the public lands are no less than 20%. However, in the Russian Arctic, the area of assigned hunting lands is still insignificant, and almost the entire territory belongs to public lands managed by public services. These services should ensure the rational use of game resources, but they have neither the financial nor the human resources to do so.

Secondly, according to the federal law "On Hunting", a hunter must be a person registered in the state hunting register. The hunter must have a hunting ticket and a permit for storing and carrying of hunting weapons, which is issued in accordance with the Federal Law "On Weapons" [13]. To fulfill all the formal requirements of the law on firearms is really difficult for indigenous hunters, especially for those who lead a nomadic lifestyle and rarely visit villages. Here is just one example. According to the existing rules, firearms must be stored in a locked metal box. However, a nomadic reindeer herder roaming the tundra cannot carry such a box on a reindeer sled. Without a rifle or a carbine, he cannot protect his reindeer herd from wolves and bears. Besides, he needs a hunting gun to provide his family with food during nomadic migrations.

In addition, there are gaps in the laws related indigenous hunting rights. Because of this, poachers can often take advantage of indigenous hunters, and indigenous hunters cannot always get sufficient access to game resources.

The Russian Law "On Hunting" (Article 12) [12] states the three most important types of hunting for Arctic residents:

- Commercial hunting: this is hunting for income, and the products of hunting may be sold
- Amateur and sport hunting: this is recreational hunting, the products of which must be used only for personal consumption or as a trophy
- Hunting in order to ensure the traditional way of life and traditional economic activities of indigenous small-numbered peoples of the North, Siberia and the Far East of the Russian Federation (refer to it hereafter as "traditional hunting").

According to Article 19 of the Federal Law "On Hinting" [12], the products of traditional hunting may both be used for personal consumption and sold to commercial companies that purchase hunting products. Traditional hunting is allowed only to indigenous peoples, and they have the right to hunt without permits, which means that in fact they may shoot or trap unlimited amounts of game. Only in some cases their hunting is restricted by special decisions of the regional authorities. These are very good rules from the point of view of protecting the rights of indigenous peoples. At the same time, they create problems, since many non-indigenous hunters shoot too much game, and in case of inspection they claim that the game was shot by their neighbors or friends from among the indigenous people. This is exactly what happens when sable furs and wild reindeer are taken in excess of the established limits.

5 Regulation of the use of hunting resource

The Russian system of game resource management system includes: limitation of hunting periods, restriction of hunting territories, and regulation of game resource harvesting. Let us consider the latter in more detail. Two approaches are used for this purpose: limits (quotas) and daily or seasonal norms of harvesting.

The limits are set by regional authorities, but for the most important species they must be agreed upon at the federal level (i.e., in Moscow). This list includes several Arctic species: wild reindeer, elk, musk ox, snow sheep, lynx and sable. The law states that the limits for them in each region are approved annually on the basis of information on the population size and the norms for withdrawal rate (potential biological removal) for each species. However, for this approach to work, firstly, regular population surveys must be conducted. Secondly, hunters must regularly report on how much game they have shot or trapped without significantly understating their hunting bags. Unfortunately, this is not always the case.

Let's consider, for example, how this approach works in managing the resources of the two most important commercial species for the indigenous population of the North of Russia: sable and wild reindeer.

At first glance, when one analyzes the data presented on the official website of the Federal Center for the Development of Hunting [7], the number of harvested animals everywhere meets the standards of game taking, and there are no problems in the management of game resources. However, the results of expert assessments show that these data are far from reality. Of course, it is difficult to check all estimates, but just in the case of sable, there is a good opportunity to do so. The main part of the sable skins shot and trapped by hunters is sold at international fur auctions, and there are official and accurate data on the number of sable skins sold annually. A comparison of these data showed that the number of skins sold at auctions is 1.5-2 times higher than the number of officially shot or trapped sables [14]. In addition, it should be noted that not all skins are sold at international auctions, since a significant part of them is sold inside the country. The reason for this discrepancy is that hunters have to pay for each license and they are interested to reduce the data on the number of harvested sables. This example shows that official records produce severely underreported data if hunters are not motivated to tell the truth.

Another example is the management of tundra wild reindeer populations. The largest Taimyr reindeer population is best studied. It grew steadily from the beginning of the 1960s, when the first aerial survey of its numbers was carried out, until 1985, and in 1985-1990, it stabilized at 590-620,000 head. In the 1970s and 1980s, intensive commercial shooting of reindeer began in the Taimyr, as well as in the neighboring regions of Evenkia and Yakutia, where reindeer annually went for wintering. For commercial shooting of reindeer, a special state enterprise was created – Taimyr Gospromkhoz (state farm). During this period, about 80,000 animals were shot annually, and young reindeer dominated among the harvested animals [15]. Both indigenous and non-indigenous hunters participated in hunting. Hunting was controlled by state agencies. The population size and number of shot reindeer were monitored. Aerial surveys were conducted annually [16, 17].

In the 1990s, during the crisis connected with market reforms, monitoring stopped. The shooting of reindeer was almost halved, and the herd increased, presumably, to 1 million heads by 2000. Later, the shooting increased again to a level of about 80,000 reindeer per year, of which half were shot without permits [15]. The reindeer population number and hunting were no more monitored. The 2017 aerial counts showed that the population had decreased to 384,000 heads. According to expert opinions [15, 17], there were several reasons for this. Firstly, uncontrolled shooting became selective – mainly large animals were killed. Secondly, since 2010, a mass harvesting of velvet antlers (young non-ossified reindeer antlers) began, which hunters cut off from the largest males, approaching the river-crossing animals in boats. After that, about 70% of the males died, and the rest were not capable of normal reproduction that year. The selective shooting and cutting of velvet antlers severely disrupted the structure of the population and considerably reduced its productivity. Only in 2019, the cutting of antlers from live reindeer was prohibited and measures were taken to monitor compliance with this ban. Third, climate change has played a role. The rivers began to clear from the ice earlier, and female reindeer are now unable to reach calving areas in time. So, many calves die.

According to experts [15, 17], in order to stop the reduction of the reindeer population, the structure of which is severely disrupted, it is necessary to reduce harvesting to 3% of the population (i.e., to about 11,000 animals). However, the authorities have so far ignored this opinion. In the hunting season of 2020–2021, the Executive Order of the governor of the Krasnoyarsk Krai allocated limits of 30,405 reindeer to the hunting farms of Taimyr and Evenkia [18]. In addition, according to the Resolution of Krasnoyarsk Krai Government, each member of the indigenous population has the right to take 8 reindeer per year in Taimyr and 7 reindeer per year in Evenkia as part of traditional hunting, while the number of animals shot by indigenous hunters is not registered. In addition, a significant portion of Taimyr reindeer migrate for wintering to Yakutia, where they are shot by local hunters according to the limits set by the Government of the Republic of Yakutia. According to experts, such a strategy will soon result in the collapse of the Taimyr population [15, 17].

Thus, the hunting of Taimyr reindeer is a case of a common-pool resources drama [19, 20]. Reindeer are hunted by several groups of hunters from three different regions (Taimyr, Evenkia, and Yakutia). Some of them shoot animals for commercial purposes and some for subsistence. Unless their actions are appropriately coordinated, the depletion of the overall resource pool is inevitable.

To manage the resources of game birds in Russia, a different approach is used: the maximum possible hunting bag per one hunter per day or per hunting season is established. Rare bird species are completely prohibited from hunting. In theory, this approach allows to reduce the hunting pressure on the population, if there is evidence that its numbers are decreasing. However, in order to use it efficiently, three conditions should be met:

- Hunters must know and comply with the established norms and rules of hunting, including even the places where permanent control over them is impossible (and this is a large part of the Arctic territory).
- Hunters should be able to distinguish one species from another, before shooting.
- Trends in the population number and in harvesting of each species should be known to the managing agencies.

Surveys in Kamchatka and Sakhalin have shown that hunters, as a rule, are well aware of mass species of Arctic birds, but do not distinguish rare ones [6]. Because of this, they often accidentally shoot endangered species. For example, along with the widespread and allowed to hunt white-fronted goose, they often shoot the lesser white-fronted goose, which looks similar to the first one but is included in the Red Data Book of the Russian Federation. Virtually all

hunters are unable to distinguish between species of waders, with the exception of a few of the largest. Waders in the Arctic are not prime targets for hunting and are harvested in small numbers. However, there are many rare and critically endangered species among small and medium-sized waders. For example, the spoon-billed sandpiper which is endemic to Chukotka. Its abundance in the world is only about 200 pairs and continues to decline [21]. In addition, hunters in the Arctic shoot banned species of waterfowl because they are unaware of the ban on hunting.

hunting authorities in the Arctic regions do not have reliable information on both game population number and the number of birds shot by hunters. Here are some examples of the severe underestimation of the Arctic bird resources harvesting. According to the calculations of V. Krivenko and V. Vinogradov [22], based on official data from state hunting agencies, the annual number of harvested ducks throughout Chukotka was estimated at 2,600, and geese at 1,600 birds (it should be noted that the authors themselves indicated that this assessment was greatly underestimated). According to one of our surveys in Chukotka in 2005, in one village of this region alone (we do not disclose the name of the village for privacy reasons) hunters shot more than 2,800 geese and about 5,000 ducks (including almost 400 Spectacled and Steller's Eiders which were prohibited from hunting).

A survey using an anonymous questionnaire of hunters in 2019 in Kamchatka [6] revealed that the total number of waders taken there by legal hunters was about 45,000 birds. Most of these birds were Arctic-nesting Whimbrel, which fly south through Kamchatka in the fall, but with them hunters also killed a significant number of rare species of Arctic waders. However, according to the Kamchatka Forestry and Wildlife Protection Agency, only 2,345 waders were shot in this region in the fall of 2019, and 2,510 waders in the fall of 2018. Many Arctic waders fly further south through Sakhalin Island. According to a similar survey conducted in 2020 on Sakhalin, at least 50,000 waders were taken on the island during the year, while according to the official data, only 302 waders were taken there. Thus, the information available to the agencies that regulate and control hunting is very far from reality.

6 Conclusion

We can conclude that the Russian game resource management system does not match the conditions of the Arctic. The bottlenecks discussed above in the management of Arctic game resources can be reduced to three main problems. The first is gapes in legislation related to the contradiction between the right of Arctic indigenous people to hunt without permission, and the need to restrict hunting in order to maintain the balance in ecosystems. The second is the lack of reliable information about game resources, including both population numbers and number of shot animals. The third is the practically total exclusion of hunters from the management of hunting resources.

All of the above problems can be solved through adaptive management of game resources and co-management with the full participation of indigenous hunters. Indeed, despite the fact that the restriction of traditional hunting by the authorities contradicts the Russian federal law, the indigenous hunters themselves have the right to limit their harvesting and they are really interested in this, so that not to undermine the base of game resources. However, to do this, they must be allowed to participate in the process of managing Arctic game resources.

Thus, in the Russian Arctic, there is a need to review the methods of game resource management in the direction of the official liberalization of indigenous hunting, more flexible and wise regulation of game resources, taking into accounts the interests of different groups of hunters.

Indigenous communities perceive themselves as guardians of traditional values, and wild animals are included in various contexts of traditional culture: myths, beliefs, rituals, etc. Thus, game species, as well as the natural environment as a whole, are an integral part of the ethno-cultural heritage, and representatives of traditional culture are the keepers of this heritage. In this context, traditional and modern ideas about the sustainability of game populations could complement, rather than contradict each other. To achieve this, it is important to adapt the mechanism of game resource management to the mentality of the indigenous peoples representing traditional cultures. Special multidisciplinary research integrating the approaches of applied environmental studies, game management, sociology and ethnology can contribute to solving this problem.

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